Indian Register of Shipping

CERTIFICATE NO: **2020TAC088**

TYPE APPROVAL CERTIFICATE

This is to certify *that the product is in accordance with the applicable rules/standards/codes as described below. The product is considered to be suitable for use in marine applications and is* ***included*** *in the list of approved products.*

MANUFACTURER	**DESMI Ocean Guard A/S**
MANUFACTURING WORKS	1. Tagholm 1, Nørresundby, 9400, Denmark 2. Desmi Pumping Technology (Suzhou) Co., Ltd 1st to 3rd floor of No.4 office building and no.5 Building, No.108 Houdai Street, SIP, Suzhou city, Jiangsu province, China
REGISTERED OFFICE	Tagholm 1, Nørresundby, 9400, Denmark
PRODUCT NAME	**BALLAST WATER MANAGEMENT SYSTEM**
MODEL NO. / TRADE NAME	CompactClean CompactClean EX
PRODUCT DESCRIPTION	Ballast Water Management System using: Mechanical Filtration followed by Ultra Violet -C Radiation during ballast water uptake Ultra Violet -C Radiation during ballast water discharge
APPLICABLE RULES/STANDARDS/CODES	- IRS Rules and Regulations for Construction and Classification of Steel Ships - MEPC 300 (72) - BWMS Code - MEPC 169 (57) - IRS Classification Notes - Type approval of electrical equipment used for control, monitoring, alarm and protection, systems for use in Ships
CONDITIONS OF APPROVAL	See Annexure-I
VALIDITY	The Certificate is valid until 30/12/2025

ISSUE DATE: **31/12/2020**

PLACE: **MUMBAI**

Pramjit Panigrahi
Sr. Principal Surveyor

ANNEXURE – I

(TO CERT. NO. 2020TAC088 DATED 31st DECEMBER 2020)

PRODUCT DESCRIPTION

Model numbers alongwith major components of the CompactClean BWMS are listed below

Model	TRC (max Inlet flow to the BWMS) Flow rate (m3/h) *	Filter		UV Reactor	
		Make: Filtrex	Unit No(s)	Make: DESMI Ocean Guard	Unit No(s)
CC-35	8 - 35 (5 - 135)	ACB-903-65	1	UV-UNIT 135	1
CC-55	10 - 55 (5 - 135)	ACB-904-80	1	UV-UNIT 135	1
CC-87	15 - 87 (5 - 135)	ACB-906-100	1	UV-UNIT 135	1
CC-135	25 - 135 (5 - 135)	ACB-910-150	1	UV-UNIT 135	1
CC-190	35 - 190 (9 - 340)	ACB-915-150	1	UV-UNIT 340	1
CC-255	35 - 255 (9 - 340)	ACB-935-200	1	UV-UNIT 340	1
CC-340	45 - 340 (9 - 340)	ACB-945-200	1	UV-UNIT 340	1
CC-500	50 - 500 (13 - 500)	ACB-955-250	1	UV-UNIT 500	1
CC-750	65 - 750 (19 - 750)	ACB-985-300	1	UV-UNIT 750	1
CC-1000	95 - 1000 (26 - 1000)	ACB-999-350	1	UV-UNIT 1000	1
CC-1500	126 - 1500 (38 - 1500)	ACB-9100-400	1	UV-UNIT 1500	1
CC-2000	126 - 2000 (52 - 2000)	ACB-9120-500	1	UV-UNIT 1000	2**
CC-2500	126 - 2500 (64 - 2500)	ACB-9200-600	1	UV-UNIT 1000 UV-UNIT 1500	1
CC-3000	126 - 3000 (76 - 3000)	ACB-9200-600	1	UV-UNIT 1500	2**

* Values in brackets are given if flow rate limits differ between Ballast Water Intake and Ballast Water Discharge, as defined by either Filter and/or UV-unit flow capacities. The flowrate limitations for Ballast Water Stripping operation corresponds to the flowrate limitations for Ballast Water Discharge.

** UV Units are to be mounted in parallel

*** Any combination of Main Unit(s) beyond the list of identified BWMS Models is allowed, as long as their respective stated Flow Rate(s) is adhered to for any given operation, and on the basis of the recognized Design Guide.

Major Components

Filter	W1-H1-HQ1 (Mesh size 20 µm) (As shown in above table)
UV Reactor / UV Unit	-W1-V1-VP1
UV Sensor	-W1-V1-BR1
UV Lamp	-W1-V1-EA1>EAXX (available in 4 and 6 KW)
External Control Box	UC03
PLC Software :	V0.52
Temperature sensor	-W1-V1-BT1
Pressure Transmitter	-W1-H1-BP1/2

Flow meter(s)	W1-BF1 (CC35 - CC1500) or W3-BF1 + W9-BF1 + W10-BF1 (CC2000 - CC3000)
Flow control valve(s)	(W1-RM2/MA2 (CC35 - CC1500) or W1-RM2/MA2 + W9-RM1/MA1 + W10-RM1/MA1 (CC2000 - CC3000))

Terms and Conditions

1. Basis of approval and reference test reports:
   1) IMO Type approval LR2015792TA-03 dated 04.09.2020 issued by Lloyds Register on behalf of Danish Environmental Agency (DEPA) and Danish Maritime Agency (DMA).
   2) Land Based Tests Report No:11821290 Final Report by DHI Denmark
   3) Shipboard Tests Report No:11821290 Final Report by DHI Denmark
   4) Environmental Tests No: 117-36341-1 Revision 1 dated 28/02/2019 issued by FORCE Technology
   5) Works assessment and functional tests on representative models CC-340 & CC-500, witnessed by IRS Surveyor
2. System Design Limitations:
   1) Temperature & Salinity: No limitation
   2) Holding Time: There is no limitation in respect of Holding Time as reflected in the report 'Hold Time Limitation of CompactClean BWMS', dated 29 August 2018
   3) UV Intensity for reactor size 135-1500 m3.h
      i. UV intensity lower Limit in All Salinities $^{*,\#}$: 227 W/m^2
      ii. UV minimum intensity @ full flow in All Salinities $^{*,\#}$: 880 W/m^2

      * UV intensity below lower limit, corresponding to an UV transmission of approx. 42% and approx. 20% of the TRC for a given model, implies that the ballast water is not treated in accordance with this certificate
      # Set in respect of max flow of given UV-Reactor size
   4) Treatment Rated Capacity (TRC): As listed in table under product description
3. The manufacturer is to maintain effective quality system complying with the most current version of ISO 9000 series.
4. Any change to approved design or construction are to be intimated and approved by IRS.
5. The records of all software changes are to be submitted to IRS for record. Major changes in the software which may affect the performance of the BWMS will require approval.
6. Ship specific modification drawings including piping, electrical, structural support/foundation, stability and other statutory plans as applicable are to be submitted for approval and installation survey onboard are to be carried for each installation. Installation in hazardous area is to be approved in each case.
7. Any additional requirement as specified in the Purchase Order regarding identification and test/trials is to be complied to the satisfaction of attending Surveyor.

Premjit Panigrahi
Sr. Principal Surveyor